HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Diru Creek Late Fall Chum
Species or Hatchery Stock:	Late Fall Chum, Chambers Creek Stock
Agency/Operator:	Puyallup Tribe of Indians
Watershed and Region:	Puyallup River/ WRIA 10
Date Submitted:	March 10, 2003
Date Last Updated:	March 10, 2003

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Diru Creek Late Fall Chum

1.2) Species and population (or stock) under propagation, and ESA status.

Late Fall Chum, *Oncorhynchus Keta,* Not Listed.

1.3) Responsible organization and individuals

Indicate lead contact and on-site operations staff lead.

Name (and title): Blake Smith, Enhancement Chief
Agency or Tribe: Puyallup Indian Tribe
Address:

Puyallup Tribe of Indians
6824 Pioneer Way E.
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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:
None

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Funding sources:	Puyallup Tribe/BIA
Staffing level:	5
Annual hatchery program operational costs:	~$314,520

1.5) **Location(s) of hatchery and associated facilities**.

Diru Creek Hatchery – The Hatchery is located at River Mile 0.25 on Diru Creek (10.0029) a tributary to Clarks Creek (10.0027) in Puyallup, Washington. Clarks Creek is a Left Bank tributary of the Puyallup River (10.0021) at River Mile 5.8.

1.6) Type of program.

Integrated Harvest

1.7) Purpose (Goal) of program.

The Diru Creek Winter chum program has a dual purpose. Chum are reared and released on site for mitigation/supplemental harvest purposes.

1.8) Justification for the program.

The integrated harvest program for the purpose of mitigation/supplemental harvest is released on site at Diru Creek Hatchery. All fish are released on site minimizing biological effects on upriver outmigrants, and minimizes the chance of returning adults straying into the natural spawning grounds upstream in the system.

1.9) List of program "Performance Standards".

Program Goal:
Artificially propagated fish will provide fishing opportunities not available with natural spawning populations.

Justification:
Benefits:
- Produce fish to meet harvest needs

Risk Avoidance:
- Limit genetic and ecological impacts to natural population to acceptable levels

Sections 1.9 and 1.10. Table

Goal (Section 1.7-1.8)	**Performance Standard** (Section 1.9)	**Performance Indicator** (Section 1.10)
Produce fish to meet harvest needs	Hatchery production contributes to harvest and maintains Tribal Treat harvest rights.	1. Able to execute fishery and have a surplus escapement at Diru Creek Hatchery every year. Harvest recorded on Fish Tickets.
	The rate of fertilization remains above a minimum of 95% and survival from egg to release above a minimum of 90%	2. Estimate the rate of fertilization and survival from egg to release
Provide the broodstock needed to maintain hatchery program	The broodstock collected meets the goals set by Hatchery management plan	3. Count the broodstock collected.
Release practices allow fish to return to desired (fishery and hatchery) areas at the desired times.	The estimation of hatchery production contribution remains above 50% throughout the fishery period.	4. Fish ticket data plus escapement to hatchery and spawning grounds.
Limit genetic and ecological impacts to natural population to acceptable levels	The proportion of HOR spawners in the naturally spawning areas remains non-significant.	5. Estimate the proportion of natural spawning population that is of hatchery origin.
	The estimate of non-hatchery fish in broodstock remains non-significant.	6. Estimate the proportion of non-hatchery origin fish in broodstock.
		7. Estimate the abundance and the temporal and spatial distribution of the natural population.

Section 11.1 Table. First column is taken from Table in section 1.9/1.10

Performance Indicator (Section 1.10)	**Methods/Comments** (Sections 11 and 12)
1. Fish ticket data.	Estimate run size and implement fishery. Count fish back to hatchery, spawning grounds, and sample fishery.
2. Estimate the rate of fertilization and survival from egg to release	Hatchery monitoring plan
3. Count the broodstock collected.	Hatchery monitoring plan
4. Fish ticket data plus escapement to hatchery and spawning grounds.	Fishery sampled and all major spawning areas surveyed. Hatchery escapement counted.
5. Estimate the proportion of natural spawning population that is of hatchery origin.	DNA samples taken on all major spawning areas in the Puyallup Watershed in 2002. Results pending analysis.
6. Estimate the proportion of non-hatchery origin fish in broodstock.	DNA collection at Diru Creek hatchery has been completed in 2002. Results pending.
7. Estimate the abundance and the temporal and spatial distribution of the natural population.	Spawning ground surveys and juvenile outmigration studies in progress. Results in: Annual Salmon, Steelhead, and Char Report: Puyallup River Watershed.

1.11) Expected size of program.

Expected size of program is 2,000,000 smolts.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

All broodstock are collected at the Diru Creek Hatchery. A minimum of 2,273 fish are needed for broodstock collection.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location. (*Use standardized life stage definitions by species presented in* Attachment 2).

Life Stage	**Release Location**	**Annual Release Level**
Fry	Diru Creek Hatchery	2,000,000

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

Smolt-to-adult survival rates are unknown.
Adult production levels are unknown.

Escapement levels for Diru Creek Hatchery

Year	Males	Females	Total
1993/94	738	538	1276
1994/95	1419	1282	2701
1995/96	1086	1228	2314
1996/97	1534	1912	3446
1997/98	953	692	1645
1998/99	2898	2366	5231
1999/00	954	676	1630

1.13) Date program started (years in operation), or is expected to start.

The Diru Creek Hatchery program for chum salmon has been in operation since 1979. Starting with BY 91, releases became on station eliminating the need for using Chambers Creek broodstock.

1.14) Expected duration of program.

The Diru Creek on station releases of chum will continue indefinitely.

1.15) Watersheds targeted by program.

Diru Creek on-station releases are targeting the Lower Puyallup River (10.0021) from River Mile 5.7 and below. This is where the majority of our fishing effort occurs.

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

Currently no other actions are being considered to obtain program goals.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.1) List all ESA permits or authorizations in hand for the hatchery program.

Currently developing HGMP that will be used to develop 4 (d) rule under ESA.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

Take actions for this program are difficult to quantify. Return timing for broodstock collection at Diru Creek Hatchery is out of the chinook salmon spawning window nor is the hatchery program engaged directly with smolt trapping.

White River Spring chinook (threatened) also exists in the Puyallup River basin. The level of take of this stock directly associated with the Diru Creek program is not available.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

Dendrogram: South Pairie population, Attachment 1 (WDFW et al. 2000).
Puyallup River Natural Spawning Escapements, Attachment 2 (WDFW et al. 2000).
Puyallup River Natural Fall Chinook Carcass Sampling Summary Attachment 3 (WDFW et al. 2000).
Natural Puyallup River Fall Chinook- Fork Length (cm) by Age, 1992-1997 Attachment 4 (WDFW et al. 2000).

"In general, Puyallup River fall chinook enter the river in from early June through October, with the peak migration in mid-to late August. Natural spawning begins in early September and is completed by early November, peaking in late September to early October. Typical of most Puget Sound summer/fall chinook stocks, Puyallup River fall chinook juveniles out-migrate as subyearlings. The majority of returning adults spawn as 4 yr-olds, with a lesser contribution of 3 year-olds. There are returns of age 2 and 5 year-old spawners, but they form a very small portion of the total spawning population (WDFW et al. 2000).

No evidence was available to suggest differential run timing between hatchery (Voights Creek) stock and the naturally spawning population(s) in Puyallup basin.

- **Identify the ESA-listed population(s) that will be directly affected by the program.**

This program does not directly affect listed fish.

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

Puget Sound Chinook, threatened:

> Naturally spawning population primarily within South Pairie Creek, however the extent of genetic similarity between hatchery stock and South Pairie Creek naturally spawners needs further examination. GSI samples have been collected within the two groups but analysis is pending on fund availability.
>
> White River Spring Chinook: Hatchery stock and wild origin fish released above Puget Sound Energies Diversion Dam are considered part of Puget Sound ESU.

Bull trout, threatened. The extent to which bull trout are affected is unknown.

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- **Describe the status of the listed natural population(s) relative to "critical" and "viable" population thresholds**

Tertiary evidence suggests increasing abundance of the natural escapement for fall chinook in the Puyallup Basin over the last ten years, Attachment 2. (WDFW et al. 2000)*draft

- **Provide the most recent 12-year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.**

Data not available

- **Provide the most recent 12-year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.**

Puyallup River Natural Spawning Escapements, Attachment 2.

- **Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.**

Data not available

2.2.3) **Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take**

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Broodstock collection directed at fall chinook salmon has a potential to take listed fall chinook salmon through migrational delay, capture, handling, and upstream release, during trap operation at Voights Creek Hatchery between dates, July 15th through February 15th. Trapping and handling devices and methods may lead to injury to listed fish through descaling, delayed migration and spawning, or delayed mortality as a result of injury or increased susceptibility to predation.

- **Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed**

fish.

Puget Sound chinook, listed March 1999. Voights Creek broodstocking efforts could include take of listed fish in the fall of 1999 and thereafter. Beginning with brood year 1999 all origin hatchery fish will be visually marked with adipose-clip. Beginning in 2002, 3 year-old returns will be able to be partitioned by origin.

- **Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).**

Not applicable. Broodstock not collected at Diru Creek, smolt trapping will occur in the lower Puyallup River at RM 10.5, but is not directly associated with the operation of the Diru Creek Hatchery program.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

Not applicable

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

Currently the Puget Sound ESU-wide hatchery plan is being developed.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

The program is run in accordance with the Puget Sound Salmon Management Plan developed under the U.S. v. Washington framework.

3.3) Relationship to harvest objectives.

"The co-managers agree harvest management should be biased toward maximum harvest of hatchery origin fall chinook, while naturally produced fall chinook should be harvested at a rate that is consistent with maintaining or improving natural stock productivity. To accomplish this the co-managers will

consider fishery opportunities and gear types that accommodate differential harvest rates on the hatchery and natural fall chinook stocks" (WDFW et al. 2000).

3.3.1) Describe fisheries benefiting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.

"Limited tag recovery information indicates that Puyallup River hatchery fall chinook historically contributed to most Washington and southern B.C. mixed stock chinook fisheries, the Puget Sound recreational fishery and the Puget Sound terminal net fisheries" (WDFW et al. 2000).

See Attachment 6. & 7. For historical recreational and tribal catches respectively.

Summary of Predicted Puyallup River Fall Chinook Exploitation Rates by Aggregated Fisheries see Attachment 8.

3.4) Relationship to habitat protection and recovery strategies.

A number of anthropogenic factors have affected fish habitat throughout the Puyallup Basin. Beginning in the late 1800's timber production began resulting bank stability problems and increased sediment loads. Habitat has also been affected by flood control activities, which have included removal of riparian vegetation, removal of large woody debris from the river channel, levee construction, gravel removal and channelization. Remedies are currently under way to mitigate some past land management practices. Land acquisitions for the construction of set-back is one such practice. The increase sinuosity created by the use the setback levies should aid in gravel and woody debris recruitment processes creating more suitable spawning habitat for adults and more refugia for rearing and outmigrating juveniles.

"The lower Puyallup River, below its confluence with the White River, and Commencement Bay estuary has both been heavily impacted by residential and commercial development. Commencement Bay has been heavily influenced by industrial uses. In 1982, the federal government ranked the Commencement Bay amongst the most hazardous waste sites in the U.S.. Restoration efforts are currently underway which are managed by the Natural Resource Damage Trustees. The trustees include NOAA, USFWS, DOE, DNR, WDFW, and the Puyallup and Muckleshoot Indian Tribes. (WDFW et al. 2000)*draft

The upper Puyallup Basin has been void of anadromous fish production since the construction of the Electron Dam in 1903. Under the Resource Enhancement Agreement the Puyallup Tribe and Puget Sound Energy are working together to design and construct a fish ladder to create bypass to this fish barrier.

3.5) Ecological interactions.

Hatchery fish can interact with listed fish species through competition and predation (Fresh 1997).

Program fish can negatively impact listed fish populations through reduced growth, survival and abundance. Several methods have been developed to assess potential negative ecological interactions and risks associated with hatchery programs (Pearsons and Hopley 1999; Ham and Pearsons 2001). The degree to which fish interact depends upon fish life-history characteristics which include: 1) size and morphology, 2) behavior, 3) habitat use and 4) movements (Flagg et al. 2000). Important considerations associated with hatchery practices include the type of species reared, fish size at time of release, number of fish released and location(s) of program releases. Interaction potential between hatchery origin fish and natural origin fish can certainly depend on habitat structure and system productivity. For example, habitat structure can influence predator-prey encounter rates (visibility), the amount of preferred spawning habitat and fish susceptibility to flushing flows. System productivity determines the degree to which fish populations may be food-limited, and thus negatively impacted by density-dependent effects. The type and degree of risk associated with releases of program fish typically involve complex mechanisms. Actual identification and magnitude of causal mechanisms negatively impacting listed fish is not always definitive due to confounding factors such as human-induced environmental changes, indirect pathway effects and the diversity of environments salmon occupy throughout their life-cycle (Li et al. 1987; Fausch 1988; Fresh 1997; Flagg et al. 2000). Given these complex mechanisms and site-specific considerations it is not surprising that for most hatchery programs, the extent of possible adverse competition and predation effects of hatchery releases on listed fish populations throughout Puget Sound have not been explicitly documented or quantified.

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

Water is supplied from two wells supplying 800 gpm (combined). An additional 200 gpm is available as surface water gravity fed from Diru Creek (WDFW et al. 2000).

Department of Ecology permit for water withdrawal is G2-25820.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

There are no listed natural fish in Diru Creek.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Broodstock for this program are collected at Diru Creek Hatchery.

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

Fish transportation equipment consists of three 600-gallon capacity tanks each is supplied with supplemental oxygen and aeration. (Blake Smith pers. comm.)

5.3) Broodstock holding and spawning facilities.

Broodstock enter volitionally into a 6,000 ft^3 holding pond where fish enumerated and spawned three days a week.

5.4) Incubation facilities.

Incubation facilities include 20 vertical stacks of 12 trays. (Blake Smith pers. comm.)

Rearing facilities.

Initial rearing uses 16 shallow troughs in the hatchery building. Additional rearing containers include four 50'x 5' x 5' raceways, two 6696 cubic foot ponds (UP1 and UP2). (Blake Smith 1999)

5.5) Acclimation/release facilities.

All chum are acclimated on site at Diru Creek Hatchery.

5.6) Describe operational difficulties or disasters that led to significant fish mortality.

Water flows to the incubator stacks were temporarily interrupted which resulted in chinook alevin mortality. The alevin mortality occurred in a December 1996 ice storm that knocked down trees crushing our supply line into the hatchery. It took two hours to repair the line. The alevin stage is where oxygen demand is at its peak in the incubators. Of the 1.0 million eggs received, 395,000 smolts were released for a 39.1% survival rate.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Hatchery has a low water alarm installed, linked via pager to hatchery staff. Also, installed on-site is a back-up diesel powered generator capable of supplying a 170 kW in the event of an electrical failure.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Initial source of broodstock originated from Chambers Creek (12.0007)

6.2) Supporting information.

6.2.1) History.

Chambers Creek has native early and late fall chum runs that have persisted with escapements between 700-800 early-run chums and 1,000 to 3,000 late run chums. Escapement numbers are for 1966-1971. The late fall run of chum in Chambers Creek are not listed.

6.2.2) Annual size.

6.2.3) **Past and proposed level of natural fish in broodstock**.

Diru Creek chum run is self-sufficient and no other outside sources will be used.

6.2.4) **Genetic or ecological differences**.

Diru Creek late fall chum enter the river and return later than the normal time chum in the Puyallup system. Genetic information has been taken with the results pending WDFW analysis.

6.2.5) **Reasons for choosing.** Chambers Creek broodstock was chosen because of it's late return timing and ease at obtaining eggs from the WDFW rack at Chambers Creek. The unique return timing allows the Tribe an extended fishing period. Some years the Puyallup Tribe is unable to fish on the normal time chum due to conservation measures. During the Tribe's steelhead fishery the late fall run of chum is also available making the fishery more desirable.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

All progeny will be reared and released at Diru Creek Hatchery and nowhere else in the system.

SECTION 7. BROODSTOCK COLLECTION

Broodstock are collected at Diru Creek Hatchery

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adults

7.2) Collection or sampling design.

70 returning adults are viral sampled by the NWIFC, and 100 adults are scale sampled. Random 1:1 mating protocols are used.

7.3) Identity.

Diru Creek Stock

7.4) Proposed number to be collected:

2273

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

2273

7.4.2) Broodstock collection **levels for the last twelve years (e.g. 1988-99), or for most recent years available:**

Year	Males	Females	Total
1993/94	738	538	1276
1994/95	1419	1282	2701
1995/96	1086	1228	2314
1996/97	1534	1912	3446
1997/98	953	692	1645
1998/99	2898	2366	5231
1999/00	954	676	1630

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

.All surplus are killed on station.

7.6) Fish transportation and holding methods.

No adults or fry are transported. Adults are held in the lower pond until spawning. Pond volume is 6,000 ft^3 and receives a flow of 1200gpm.

7.7) Describe fish health maintenance and sanitation procedures applied.

NWIFC samples our returning chum for viruses and pathogens. A dry single bucket is used for

spawning one pair. After fertilization four pair are placed in a heath tray with a 1:100 solution of an iodofore during the water hardening process. Eggs are incubated in single stacks of 12 and are isolated from other Heath tray stacks by front covers.

7.8) Disposition of carcasses.

Carcasses are used for nutrient loading in the Upper Puyallup River.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

The rack will only be in operation during the late fall return period. All resulting juveniles will be imprinted and released from Diru Creek.

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

Matings occurs at Diru Creek hatchery.

8.1) Selection method.

Random. Fish are beached seined up throughout the run timing, three days a week and checked for ripeness. Fish that are ripe are killed and then spawned immediately using 1:1 mating protocols.

8.2) Males.

One male is used for one female. No backup males are used in the spawning process.

8.3) Fertilization.

Milt and eggs are mixed in a single dry bucket. After mixing eggs and milt are placed in an iodofore solution of 1:100 during the water hardening process. Approximate time of 1 hour.

8.4) Cryopreserved gametes.

Not applicable

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

None.

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. "egg to smolt survival") that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

Data not available for egg to eye-up or ponding. Data is available for egg to release of fry and is given in the table below.

9.1.2) Cause for, and disposition of surplus egg takes.

No surplus eggs takes have been taken since operation of Diru Creek Hatchery. Surplus eggs have been sold to help operation costs at the Hatchery.

9.1.3) Loading densities applied during incubation.

8,800 eggs per Heath tray

9.1.4) Incubation conditions.

Eggs are reared on well water at constant 50 degrees Fahrenheit. D.O. measurements in the incubator stacks are approximately 12 ppm. The incubator stacks are twelve high; the top tray is left empty because of light penetration. All 20 stacks available are used at the hatchery.

9.1.5) Ponding.

Fish are ponded when approximately 95% of the fish are buttoned up. Fish are force ponded, which typically occurs in February. (Blake Smith pers. comm.)

9.1.6) Fish health maintenance and monitoring.

Formaldehyde is used as an anti-fungal agent for eggs. It is injected into the water supply line for each stack at a concentration of 1:600 for 15 minutes every other day.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

Not applicable, hatchery stock is not listed.

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available..

Survival data on hatchery fish is available and is calculated from stage received at facility through time of release.

Brood Year	% Survival	Stage Received	Fry out-planted
1991	99.6	428,500 eyed eggs	426,813
1992	93.6	326,000 eyed eggs	305,253
1993	73.1	1,577,500 green eggs	1,153,141
1994	76.8	2,263,200 green eggs	1,738,599
Brood Year	% Survival	Stage Received	Fry out-planted
1995	73.1	1,577,500 green eggs	1,153,141
1996	60.3	2,049,600 green eggs	1,235,328
1997	75.5	1,311,400 green eggs	990,690
1998	90.5	2,129,600 green eggs	1,927,970
1999	92.9	1,394,800 green eggs	1,295,738

9.2.2) Density and loading criteria (goals and actual levels).
Include density targets (lbs fish/gpm, lbs fish/ft3 rearing volume, etc).

Rearing densities dependent on fish size
500-1000 fpp .5 lb/ft^3/in, 2 lbs/gpm (maximum threshold)

50-500 fpp .5 lb/ft^3/in, 6 lbs/gpm (maximum threshold)

9.2.3) Fish rearing conditions

Description of rearing units

Unit	Cubic Feet	Flow *	Exchange/HR
H1-H16	512	500	7.81
R1-R4	2500	420	1.34
UP1-UP2	13392	750	0.45
LP	13000	1250	0.77

*= Average flow

Diru Creek Hatchery
Temperatures range from 50-52 F
DO approximately12 ppm
(Blake Smith pers. comm.)

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

Chum

Rearing Unit Netart #1:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
02-14-91	172,000	2000	0.52	3.07	--	28gpm
03-28-91	142,500	1465	0.59	3.47	0.94	28
04-12-91	26,180	1107	0.15	0.84	0.69	28
05-01-91	25,924	614	0.26	1.50	0.74	28
05-16-91	25,924	300	0.53	3.09	0.86	28
05-30-91	13,624	195	0.43	2.50	0.75	28

Rearing Unit Netart #2:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
02-14-91	202,000	2000	0.62	3.60	--	28gpm
03-28-91	192,500	1164	1.00	5.90	0.77	28

Rearing Unit L1-3:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
04-12-91	83,041	1164	0.07	0.91	0.74	78gpm
05-01-91	82,091	614	0.13	1.71	0.74	78
05-15-91	82,091	300	0.27	3.51	0.86	78
05-30-91	50,591	195	0.26	3.32	0.75	78

Rearing Unit L4-6:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
04-12-91	88,413	1107	0.08	1.02	0.69	78gpm
05-01-91	87,972	614	0.14	1.84	0.74	78
05-15-91	82,091	300	0.27	3.51	0.86	78
05-30-91	50,591	195	0.26	3.32	0.75	78

Late Chum

Rearing Unit R1:

Date	**# of Fish**	**#/pound**	**lbs/cu ft**	**lbs/gpm**	**C.F.**	**Flow**
02-11-92	368,500	1960	0.19	1.57	--	120gpm
03-23-92	397,169	1419	0.28	2.33	0.85	120
04-07-92	199,469	825	0.24	2.01	0.77	120
04-17-92	98,819	432	0.23	1.91	0.77	120
05-01-92	98,687	289	0.34	2.85	0.79	120

Rearing Unit R2:

Date	**# of Fish**	**#/pound**	**lbs/cu ft**	**lbs/gpm**	**C.F.**	**Flow**
04-07-92	197,700	769	0.26	2.14	0.77	120gpm
04-17-92	100,806	420	0.24	2.00	0.77	120
05-01-92	100,674	264	0.38	3.18	0.82	120

Late Chum

Rearing Unit H1-H16:

Date	**# of Fish**	**#/pound**	**lbs/cu ft**	**lbs/gpm**	**C.F.**	**Flow**
25-Mar-93	349,688	1164	0.58	0.60	1.00	500gpm

15-Apr-93	153,885	733	0.41	0.42	0.77	500

Rearing Unit R1:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
15-Apr-93	76,002	710	0.17	1.01	0.78	105gpm
03-May-93	75,597	242	0.50	2.97	0.86	105
15-May-93	75,590	217	0.56	3.32	0.86	105

Rearing Unit R2:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
15-Apr-93	75,974	710	0.17	1.01	0.78	105gpm
03-May-93	75,911	242	0.50	2.97	0.86	105
15-May-93	75,885	217	0.56	3.33	0.86	105

Rearing Unit R3:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
03-May-93	76,083	332.7	0.37	2.18	0.84	105gpm
10-May-93	76,080	290	0.42	2.50	0.84	105

Rearing Unit R4:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
03-May-93	77,931	332.7	0.37	2.23	0.84	105gpm
10-May-93	77,354	290	0.43	2.54	0.84	105

Late Chum
Rearing Unit H1-H16:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
24-FEB-94	397,500	1385	0.56	1.73	0.71	500gpm

Rearing Unit UP1:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
15-MAR-94	397,137	802	0.07	1.98	0.77	250gpm

Rearing Unit R1:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
31-MAR-94	189,340	1217	0.25	1.48	0.81	105gpm
15-APR-94	142,229	607	0.37	2.23	0.81	105
02-MAY-94	83,502	268	0.50	2.97	0.83	105
16-MAY-94	73,805	335	0.35	2.10	0.81	105

Rearing Unit R2:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
02-MAY-94	78,419	429	0.29	1.74	0.85	105gpm
16-MAY-94	79,757	278	0.46	2.73	0.79	105

Rearing Unit R3:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	C.F.	Flow
15-APR-94	123,678	876	0.23	1.34	0.77	105gpm
02-MAY-94	123,678	471	0.42	2.50	0.80	105
12-May-94	79,757	311	0.40	2.44	0.76	105

Late Fall Chum

Rearing Unit R1:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
03-MAR-96	101,000	630	0.26	1.60	47	0.69	100gpm
03-APR-96	103,100	1000	0.16	1.03	38	---	100
01-MAY-96	102,700	559	0.29	1.84	46.5	0.81	100

Rearing Unit R2:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
03-MAR-96	120,000	698	0.27	1.71	45	0.71	100gpm
03-APR-96	103,000	1000	0.16	1.04	38	----	100
01-MAY-96	102,900	524	0.31	1.96	47	0.82	100
10-MAY-96	73,360	560	0.21	1.31	47	0.81	100
06-JUN-96	73,300	308	0.38	2.38	58	0.74	100

Rearing Unit R3:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
28-MAR-96	115,000	926	0.20	1.24	41	0.74	100gpm
09-APR-96	114,987	736	0.25	1.33	42	0.71	100
01-MAY-96	114,857	694	0.27	1.66	43	0.81	100
24-May-96	114,800	232	0.76	4.96	61	0.84	100

Rearing Unit R4:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
28-MAR-96	100,000	989	0.16	1.01	40	0.69	100gpm
09-APR-96	99,987	754	0.21	1.33	42	0.71	100

Late Fall Chum

Rearing Unit R1:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
12-MAR-97	130,000	1080	0.19	1.50	40	0.66	80gpm
10-APR-97	129,000	580	0.36	2.78	48	0.71	80
29-APR-97	125,000	382	0.52	4.09	54	0.75	80
14-MAY-97	124,000	243	0.82	6.37	61	0.81	80

Rearing Unit R2:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
12-MAR-97	110,000	1080	0.16	1.28	40	0.66	80gpm
10-APR-97	109,000	617	0.28	2.21	47	0.71	80
29-APR-97	104,000	408	0.41	3.19	53	0.76	80
14-MAY-97	103,000	257	0.64	5.00	61	0.79	80

Rearing Unit R3:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
12-MAR-97	143,250	1080	0.21	1.65	40	0.66	80gpm
10-APR-97	142,250	508	0.45	3.50	50	0.72	80
29-APR-97	140,000	315	0.71	5.56	56	0.80	80
15-MAY-97	45,497	277	0.36	1.00	58	0.82	80

Rearing Unit R4:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
12-MAR-97	143,250	1080	0.21	1.65	40	0.66	80gpm
10-APR-97	142,550	514	0.44	3.46	49	0.72	80
29-APR-97	140,000	352	0.64	4.97	55	0.79	80
14-MAY-97	140,000	215	1.04	8.14	61	0.88	80

Late Fall Chum
Rearing Unit R1:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
11-Mar-98	106,613	775	0.22	0.58			80gpm
03-Apr-98	106,000	616	0.27	2.15			80gpm
13-Apr-98	105,500	576	0.29	2.29			80gpm
27-Apr-98	105,500	378	0.45	3.48			80gpm

Rearing Unit R2:

Date	# of Fish	#/pound	lbs/cu ft	lbs/gpm	Length	C.F.	Flow
11-Mar-98	178,408	825	0.34	2.70			80gpm
03-Apr-98	178,000	673	0.42	3.31			80gpm
13-Apr-98	177,500	576	0.49	3.85			80gpm

Chum

Date	# of Fish	Rearing Location	Rearing Capacity	Flow	Fish/pound	Lbs/gpm	Lbs/cu. ft.	temp	Biomass
26-Feb-99	51,679	R1	625	80	725	0.89	0.11	50	71.25
26-Feb-99	72,530	R2	625	80	892	1.01	0.13	50	81.25
01-Mar-99	155,876	R3	625	80	1300	1.49	0.19	50	119.9
01-Mar-99	155,876	R4	625	80	1300	1.49	0.19	50	119.9
22-Mar-99	77,938	R3	625	80	731	1.32	0.17	50	106
22-Mar-99	77,938	R4	625	80	648	1.50	0.19	50	120
22-Mar-99	77,938	R1	625	80	648	1.50	0.19	50	120
22-Mar-99	77,938	R2	625	80	731	1.32	0.17	50	106
06-Apr-99	77,800	R1	625	80	341	2.85	0.36	50	228
06-Apr-99	77,800	R2	625	80	341	2.85	0.36	50	228
12-Apr-99	77,800	R3	625	80	369	2.63	0.34	50	210
12-Apr-99	77,800	R4	625	80	357	2.72	0.35	50	218

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

Data not available

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Diru Creek Hatchery
Fry fed Biostarter once per hour, 8 hours a day, 5 days a week
Fingerlings on site fed Biodry 1000 reduced frequency every two hours, 8 hours a day, 5 days a week.
%B.W./day = 3to5%
lbs/gpm inflow~0.5
F.C.=1.3
(Blake Smith pers. comm.)

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

Each year, fish pathologists screen a representative number of adults returning to tribal hatcheries for pathogens that may be transmitted to the progeny. The exact number of fish to be tested from each stock is specified in the Co-managers Salmonid Control Policy. Pathologists work with hatchery crews to help avoid pre-spawning mortality of broodfish to maximize fertilization and egg survival.

Preventative care is also promoted through routine juvenile fish health monitoring. Pathologists conduct fish health exams at each of the tribal hatcheries on a monthly basis from the time juveniles' swim-up until they are released as smolts. Monthly monitoring exams include an evaluation of rearing conditions as well as lethal sampling of small numbers of juvenile fish to assess the health status of the population and to detect pathogens of concern. Results are reported to hatchery managers along with any recommendations for improving or maintaining fish health. Vaccine produced by the TFHP may be used when appropriate to prevent the onset of two bacterial diseases (vibriosis or enteric redmouth disease). In the event of disease epizootics or elevated mortality in a stock, fish pathologists are available to diagnose problems and provide treatment recommendations. Pathologists work with hatchery crews to ensure the proper use of drugs and chemicals for treatment. The entire health history for each hatchery stock is maintained in a relational database called AquaDoc. (Northwest Indian Fisheries Commission Fish Pathology pers.comm.)

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

Not applicable

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

Not applicable.

9.2.10) **Indicate risk aversion measures that will be applied to minimize the likelihood for**

adverse genetic and ecological effects to listed fish under propagation.

Fish will be reared to smolt size to mimic the natural fish emigration strategy and are released volitionally.

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1) Proposed fish release levels.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Fry	2,0000,000	1000-300 fpp	Late April-Early May	On-station

10.2) Specific location(s) of proposed release(s).
Stream, river, or watercourse:
Release point:
Major watershed:
Basin or Region:

See 10.3

10.3) Actual numbers and sizes of fish released by age class through the program.

Chum

STREAM	WRIA	#/lb	DATE	# of FISH	BIOMASS	MILE
Diru Cr.	10-0029	1164	04-12-91	54,708	47.0	1.0
Diru Cr.	10-0029	1107	04-12-91	58,671	53.0	1.0
Hylebos Cr.	10-0016	1107	04-21-91	1,107	1.0	
Diru Cr.	10-0029	300	05-17-91	74,100	247.0	1.0
Clarks Cr.	10-0027	195	05-31-91	108,420	556.0	1.0
TOTAL				**298,956**	**914.0**	

Late Chum

STREAM	WRIA	#/LB	DATE	# OF FISH	BIOMASS	MILE
Swan	10-0023	825	04-07-92	100,650	122	1
Hylebos	10-0013	769	04-07-92	96,894	127	1.5
Clark	10-0027	297	05-04-92	95,337	321	1
Clark	10-0027	272	05-04-92	66,368	244	1
Diru	10-0029	297	05-04-92	36,828	124	1
Diru	10-0029	272	05-04-92	30,736	113	1
TOTAL				**426,813**	**1,051**	

Late Chum

STREAM	WRIA	#/LB	DATE	# OF FISH	BIOMASS	MILE
Diru Cr.	10-0029	290	10-May-93	153,434	528	0.5
Diru Cr.	10-0029	217	13-May-93	75,885	350	0.5
Diru Cr.	10.0029	217	15-May-93	75,934	350	0.5
TOTAL				**305,253**	**1,228**	

Late Chum

STREAM	WRIA	#/LB	DATE	# OF FISH	BIOMASS	MILE
Diru Cr.	10-0029	1385	18-MAR-94	200,000	144	0.5
Diru Cr.	10-0029	802	21-MAR-94	373,443	466	0.5
Diru Cr.	10.0029	1220	25-MAR-94	125,660	103	0.5
Diru Cr.	10.0029	1102	4-APR-94	47,111	43	0.5
Diru Cr.	10.0029	607	15-APR-94	58,727	97	0.5
Diru Cr.	10.0029	275	5-MAR-94	83,502	304	0.5
Diru Cr.	10.0029	417	5-MAR-94	43,921	93	0.5
Diru Cr.	10.0029	311	12-MAY-94	4,665	15	0.5
Puget Cr.	12.0002A	311	12-MAY-94	12,479	40	0.1
Hylebos Cr	10.0013	311	12-MAY-	73,805	221	0.5
Diru Cr.	10.0029	278	16-MAY-94	79,757	287	0.5
TOTAL				**1,153,141**	**1,974**	

Late Chum

STREAM	WRIA	#/LB	LENGTH	DATE	# OF FISH	BIOMASS
Diru Cr.	10.0029	1076	39	04/09/96	400,000	372
Diru Cr.	10.0029	600	47	04/03/96	101,000	168
Diru Cr.	10.0029	658	47	04/03/96	120,000	171
Diru Cr.	10.0029	736	45	04/09/96	115,000	156
Diru Cr.	10.0029	754	44	04/09/96	100,000	133
Diru Cr.	10.0029	559	46	05/01/96	102,700	184
Diru Cr.	10.0029	524	47	05/01/96	102,000	195
Diru Cr.	10.0029	232	61	05/24/96	115,000	496
TOTAL					**1,229,960**	**2,114**

Late Chum

STREAM	WRIA	#/LB	LENGTH	DATE	# OF FISH	BIOMASS
Diru Cr.	10.0029	1080	40	12-Mar-97	257,000	238
Diru Cr.	10.0029	1157	38	6-Mar-97	61,600	53
Diru Cr.	10.0029	1157	38	12-Mar-97	50,000	43
Diru Cr.	10.0029	1157	38	20-Mar-97	160,000	139
Diru Cr.	10.0029	1314	36	21-Mar-97	199,728	152
Diru Cr.	10.0029	315	56	30-Apr-97	140,000	444
Diru Cr.	10.0029	243	61	14-May-97	124,000	510
Diru Cr.	10.0029	257	61	14-May-97	103,000	401
Diru Cr.	10.0029	215	62	14-May-97	140,000	651
TOTAL					**1,235,328**	**2,631**

Late Chum

STREAM	WRIA	#/LB	LENGTH	DATE	OF FISH	BIOMASS
Diru Cr.	10.0029	750		21-Mar-98	350,000	467
NoName	10.0593.5	1134		8-Apr-98	93,380	70
Diru Cr.	10.0029	1130		7-Apr-98	279,300	210
Puget Cr.		1130		9-Apr-98	62,510	47
Diru Cr.	10.0029	1330		9-Apr-98	100,000	75
Diru Cr.	10.0029	378	56	27-Apr-98	105,500	279
TOTAL					**990,690**	**1,148**

Late Chum

STREAM	WRIA	#/LB	LENGTH	DATE	# OF FISH	BIOMASS
Puget Cr.	Puget Cr.	eyed eggs		02-Feb-99	30,000	
Diru Cr.	10.0029	907	42	26-Feb-99	29,704	32.75
Diru Cr.	10.0029	1163	39	26-Feb-99	35,181	30.25
Diru Cr.	10.0029	1106	39	26-Feb-99	43,687	39.50
Diru Cr.	10.0029	889	40	26-Feb-99	28,670	32.25
Diru Cr.	10.0029	1106	39	26-Feb-99	45,623	41.25
Diru Cr.	10.0029	1193	39	26-Feb-99	41,755	35.00
Diru Cr.	10.0029	1079	39	26-Feb-99	43,700	40.50
Diru Cr.	10.0029	1259	38	26-Feb-99	39,029	31.00
Diru Cr.	10.0029	1296	38	26-Feb-99	32,724	25.25
Diru Cr.	10.0029	1300	37	26-Feb-99	50,000	38.46
Diru Cr.	10.0029	890	42	05-Mar-99	491,244	552.00
Diru Cr.	10.0029	1199	40	15-Mar-99	37,788	32.00
Diru Cr.	10.0029	1399	39	15-Mar-99	37,788	27.00
Diru Cr.	10.0029	1060	40	15-Mar-99	37,788	36.00
Diru Cr.	10.0029	1233	40	15-Mar-99	37,788	31.00

Diru Cr.	10.0029	1007	42	15-Mar-99	37,788	38.00
Diru Cr.	10.0029	257	64	22-Mar-99	51,679	201.00
Diru Cr.	10.0029	367	57	22-Mar-99	72,530	198.00
Diru Cr.	10.0029	582	46	23-Mar-99	40,000	69.00
Diru Cr.	10.0029	646	45	29-Mar-99	30,000	46.00
Diru Cr.	10.0029	890	42	05-Apr-99	20,000	22.00
Diru Cr.	10.0029	341	51	06-Apr-99	77,800	228.00
Diru Cr.	10.0029	341	50	06-Apr-99	77,800	228.00
Diru Cr.	10.0029	369	50	12-Apr-99	77,800	211.00
Diru Cr.	10.0029	357	50	12-Apr-99	77,800	218.00
Diru Cr.	10.0029	454	50	19-Apr-99	302,304	666.00
				TOTAL	**1,927,970**	**3149.21**

http://www.nwifc.wa.gov/CRAS.asp

10.4) Actual dates of release and description of release protocols.

Diru Creek Hatchery releases are forced released
See 10.3

10.5) Fish transportation procedures, if applicable.
Not applicable.

10.6) **Acclimation procedures.**

Not applicable

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

None.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

Not applicable

10.9) Fish health certification procedures applied pre-release.

Fish health is monitored monthly by Northwest Indian Fisheries Commission Fish Health Staff.

10.10) Emergency release procedures in response to flooding or water system failure.

In the event of catastrophic water failure fish would be released early. (Blake Smith, pers. comm.)

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

Given the perceived risks associated with hatchery programs (see section 3.5), Hatchery chum salmon are reared and released in a manner to minimize potential negative impacts on listed chinook salmon and bull trout populations. These measures include:

Chum salmon fry are 1 gram or less at time of release. Chinook salmon caught in beach seine sampling in Commencement Bay have had juvenile chum in their stomachs.

Location of Diru Creek Hatchery is low in the watershed reducing freshwater interaction potential.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

Monitoring and evaluation plan is currently being developed

11.1) Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each "Performance Indicator" identified for the program.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

SECTION 12. RESEARCH

Currently, no funded research is occurring with this stock.

12.1) Objective or purpose.

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12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table 1).
12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

SECTION 13. ATTACHMENTS AND CITATIONS

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Washington Department of Fish and Wildlife, Muckleshoot Tribe of Indians, and the Puyallup Tribe of Indians. 2000. The Puyallup River Fall Chinook Recovery Plan. Contact: Chuck Baranski, WDFW Fish Program Region 6

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SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

"I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973."

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: _____ ESU/Population:_____ Activity:_____				
Location of hatchery activity:_____ Dates of activity:_____ Hatchery program operator:_____				
Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)				
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)				
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.

g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.

Instructions:

1. An entry for a fish to be taken should be in the take category that describes the greatest impact.
2. Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).
3. If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table